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LADINO WHITE CLOVER

for the
NORTHEASTERN STATES

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LADINO CLOVER

a giant of the white clovers

PRODUCES ABUNDANTLY in the
NORTHEASTERN STATES

Advantages:

Provides for increases of milk, meat, and egg production at lower cost.

Has high carrying capacity.

Produces home-grown high-protein mineral feed.

Is excellent for grazing.

Is good for hay and silage.

Requirements:

Apply mineral fertilizers generously.

Lime soil if it is moderately to strongly acid.

Provide a firm seedbed.

Seed in mixtures with other clovers and orchard grass or timothy.

Seed 2 pounds per acre.

Top-dress with manure.

Grazed in rotation for highest yields.

Precautions:

In mixtures, seed orchard grass lightly.

Do not graze closely.

Do not reduce the life of the stand by mixing Kentucky bluegrass with the Ladino.

Grow with grass to reduce bloat hazard.

Wilt before ensiling.

Use preservatives in making silage.

Ladino clover is not suited for lawns.

LADINO WHITE CLOVER FOR THE NORTHEASTERN STATES

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LADINO CLOVER is a stanch ally of the farmers of the Northeastern States in their efforts to produce more milk, meat, and eggs at lower cost during the war emergency. The high carrying capacity of Ladino clover for grazing and its adaptability for hay and silage fit the limited farming areas of this region and enable farmers to grow most of the protein needed for livestock, dairy, and poultry production. This home-grown protein relieves transportation facilities and saves labor, thus releasing these two vital necessities for other uses in connection with winning the war.

In the Northeastern States Ladino clover (*Trifolium repens* L.), a giant form of common white clover, is rapidly becoming the foundation of an intensive grassland agriculture. Its culture and soil requirements are more exacting than those of common white clover, but the diversity of its uses, its high carrying capacity for all classes of livestock and poultry, and the high nutritive value of the feed are important characteristics that create interest in the plant and encourage its use.

In the humid States immediately west of the northeastern region Ladino clover is being tried extensively, with favorable results. This clover is principally valuable for grazing, but it is also being successfully used for silage, for hay, and as a cover crop.

Where Ladino Clover Came From

Ladino clover appears to have come from and to have derived its name from Lodi, a town in the Province of Lombardy in northern Italy, where it was first found to be growing extensively. Seed was brought into the United States shortly before 1900, but it was not until 1912 that large quantities were imported and the crop successfully grown in the irrigated valleys of the Western States. It has been repeatedly tried in the Eastern States but was not generally successful until certain conditions necessary for satisfactory growth and persistency were recognized.

What It Is

Ladino clover is a rapid-growing perennial legume, spreading by creeping fleshy stems that root at the nodes. Depending upon the favorableness of the soil, climate, and management, the leaves, stems, and flower heads of Ladino clover grow from two to four times as large as those of common white clover and about six times as large as those of the English wild white clover.

The shape, color, and markings of the leaves and the shape and color of the flower heads of Ladino clover are similar to those of common white clover. Ordinarily Ladino does not flower so profusely as most other types of white clover. In more or less thin stands, or when young, the leaves are relatively far apart, giving an open appearance in the cover.

In size and color Ladino clover seed is the same as that of other white clover

It Is Especially Suited to the Northeast

From Maine to Maryland successful stands of Ladino clover have been established and maintained for several years. Formerly this clover was considered nonhardy in the Northern States. It has now been shown to be capable of surviving cold winters if given proper fertilization, proper grazing or cutting management, and a compatible grass association. Ladino clover is best adapted to the more fertile, moisture-retaining soils in the States having relatively cool summer temperatures. Good stands and growth have been obtained on thin upland soils by means of heavy fertilizer applications. In the southern part of this region it has been successfully grown on low-lying fertile soils. Although Ladino clover is not drought-resistant, it will tolerate periods without rainfall if associated grasses do not offer too much competition. In many places stands of Ladino clover have been lost when planted on soils that remain wet for long periods. In order to obviate failures of first trials, it is recommended that the most favorable location and the best cultural treatments be given to initial plantings.



LADINO WHITE



COMMON WHITE



ENGLISH WILD WHITE

How To Grow It

Fertilizers

The high production potentiality of Ladino clover indicates that it requires large quantities of available plant food, particularly minerals. Although Ladino clover will grow in medium to slightly acid soils, calcium is needed for plant growth. Calcium is occasionally present in the soil in sufficient quantities, but ordinarily calcium must be added either by application of lime or phosphate fertilizers that contain calcium. Large applications of phosphate fertilizers are generally necessary for continuous satisfactory growth. Potash, which is generally deficient in soils of this region, is also essential. The amounts to use depend upon the character of the soil and the previous cropping practices. Four to six hundred pounds per acre of 20-percent superphosphate and, if there is a potash deficiency, 200 pounds per acre of muriate of potash, or their equivalents, have been profitable. In establishing a stand small amounts of nitrogen in some instances have been beneficial. Three to five tons per acre of well-rotted manure worked into the soil before seeding aids rapid stand establishment and growth but does not take the place of mineral fertilizers.

Ladino clover responds to annual top dressings of fertilizers, as the greater part of its root system is shallow. Throughout most of the region applications should be made in the early spring, but in the southern part fall applications are generally preferable. The returns from Ladino clover more than compensate the cost of the additional fertilizer. Top dressing established Ladino clover fields with manure in early winter yields profitable results.



Without sufficient fertilization, no Ladino clover.



An excellent mixture of Ladino clover and timothy in Maine obtained by seeding 2 pounds of Ladino clover and 6 pounds of timothy per acre. A mixture of Ladino clover, red clover, alsike clover, and orchard grass also gives a fine stand.

How To Prepare the Seedbed

For early spring planting fall plowing is recommended, as it provides an opportunity for the soil to settle during the winter months. For fall seedings the land should be prepared during the summer months. For all seedings the soil should be thoroughly compacted, preferably with a corrugated roller. A loose seedbed is the forerunner of stand failure. Fertilizers should be applied to the soil before it is disked, harrowed, and rolled to prepare a firm seedbed. In moist years good stands frequently have been established on thin turf by thorough disking, harrowing, heavy fertilizing, seeding, and rolling.

Seeding

Ladino clover may be seeded alone or with grasses and legumes, with or without a companion grain crop. The use of certified seed is recommended, as it is not possible to distinguish it from common white clover seed. Ladino clover seed is often hard, and unless there is a germination of 60 percent it should be scarified. The presence of from 10 to 40 percent of hard seed is not objectionable, because the delayed germination of such seed may insure the establishment of a stand if part of the early seedlings are killed by unfavorable weather conditions. Preliminary tests of seed lots from different sources have shown that source of seed is, as yet, not important.

Under the most favorable fertility and moisture levels, orchard grass appears to be the most suitable grass to grow in association with Ladino clover, as it withstands frequent grazing and still does not crowd out the clover. Timothy and Ladino clover mixtures have been successful, particularly where the soil productivity level is not high or where summer temperatures remain favorable for a continuous growth of timothy. Mixtures of Ladino clover and brome grass, meadow fescue, or reed canary grass appear promising in experimental plantings and may prove to be better in mixture than orchard grass or timothy. Kentucky bluegrass should not be seeded with Ladino clover except when a permanent grass pasture is desired, as the Kentucky bluegrass soon crowds out the Ladino clover.

Many seeding mixtures have been recommended, some of which have resulted in a predominance of grass to the detriment of the Ladino clover, which has tended to discourage the use of any grass in the mixture. This is unfortunate, as a grass mixture counteracts the excessive succulence of pure Ladino clover, reduces the hazard of bloating, and facilitates the curing of the hay and the handling of the herbage for silage.

The productivity of the soil, fertilizer application, condition of the seedbed, and the weather following seeding are all factors that affect the stand and proportion of grass to Ladino clover. A seeding mixture of 2 pounds of Ladino clover and 5 to 7 pounds of orchard grass per acre has been extensively used. Under favorable conditions for the grass, this mixture has frequently resulted in a pure grass pasture by the end of the second year. At the higher fertility levels the following mixture and rates per acre have proved satisfactory: Oats, 1 bushel; red clover, 3 pounds; alsike clover, 2 pounds; Ladino clover, 2 pounds; orchard grass, 3 pounds. At lower fertility levels or where summer temperatures are relatively cool, from 5 to 7 pounds per acre of timothy may be substituted for orchard grass.

The average life of a good Ladino clover and grass planting is from 4 to 7 years, depending upon the fertilization and management practices and the rate of encroachment of Kentucky bluegrass from either volunteer stands or seeding. If a stand of Ladino clover is crowded out by a thick growth of Kentucky bluegrass and reestablishment is desired, the turf should be fall-plowed and seeded to corn or another cultivated crop the following year, after which Ladino clover may be reseeded. Care should be taken in the cultivation to thoroughly kill the bluegrass, otherwise it will rapidly increase. In the southern part of the region, mixtures of Ladino clover, alfalfa, red clover, alsike clover, orchard grass, and timothy have given good results. The seed is usually broadcast and may be either lightly covered by rolling or by the first rain. In the northern part of the region, seed should be sown in the early spring, although in years with abundant moisture late summer seedings have resulted in good stands. South of the 40° latitude fall seedings are generally the most successful. Small plants are particularly susceptible to heaving, and it is important that sufficient time be given for establishment before the advent of cold weather. Inoculation is unnecessary, but to insure a crop, it may be advisable, particularly at the first seeding.

It Has Many Uses

Even though Ladino clover is an intensive crop requiring heavy fertilization and care in management, the end results adequately repay the effort.

Pasture

All classes of livestock have been grazed on Ladino clover or Ladino clover-grass mixtures with excellent results. It is particularly valuable for dairy cattle and poultry where a high-yielding, nutritious, high-protein feed is needed, where labor is scarce, and where land suitable for cultivation is limited. Methods of grazing and heights at which the clover is grazed largely determine the amount of forage produced and the length of life of the stand.

Rotation grazing, which permits the development of new growth before the animals are turned back into the field, has been found to increase the carrying capacity and prolong the life of the stand. After each grazing the clover should be allowed to grow to a height of 8 to 15 inches. During periods of drought it will not grow as tall as that. Ladino clover should not be grazed closer than 3 to 5 inches. It is a temptation for many livestockmen to disregard the hazard of grazing too closely. Close continuous grazing delays recovery, weakens the plants, and encourages the encroachment of Kentucky bluegrass. For the maintenance of maximum production under intensive pasturing, many successful farmers have found that the use of three fields is necessary. Under favorable climatic conditions one to two cows per acre can be maintained.

Maximum utilization can be obtained when the cattle are permitted to graze until they complete a fill and are then removed. On good stands with good growth, 2 to 3 hours' grazing in the morning and a similar period in the afternoon is sufficient. This practice minimizes the loss of good grazing by flattening as the animals lie down to ruminate. As heavy grazing is conducive to winterkilling, lighter grazing should be practiced in the fall. It is believed that grazing mature leaves reduces the possibility of bloat in cattle and sheep, as young succulent leaves are more conducive to bloat. Frequently parts of a field are either more closely grazed or the plants fail to make good growth in dry seasons owing to the shallowness of the soil. A thin layer of manure applied over these areas will afford protection by reducing the grazing and will stimulate plant growth.

Hay and Silage

Although primarily a grazing crop, Ladino clover is increasingly used for hay and silage, particularly when grown with other legumes and grasses. A heavy growth is difficult to cure, because of the high water content of the herbage, and in ensiling the crop this must be taken into account. A good quality of Ladino clover-grass silage can be made by allowing it to wilt in the swath and by the use of preservatives.

Oats used as a companion crop with the mixture of red clover, alsike clover, Ladino clover, and orchard grass may be grazed off when approximately 1 foot high. The red clover and alsike clover, together with the oats, furnish the bulk of the grazing the first year. If preferred, the first crop may be harvested for hay or silage and the subsequent crops grazed or made into hay. The second year Ladino clover and the grass compose more of the herbage, and in the third year the mixture is chiefly Ladino clover and grass.

Lawn and Cover Crop

Ladino clover is not suitable for lawns. The tall growth and rapid recovery after cutting make an unsightly, ragged turf. Close clipping will destroy the stand in a relatively short time. Horticulturists are successfully using Ladino clover as a cover crop in orchards. However, it is not recommended for this purpose unless sufficient fertilizer can be applied to develop a stand and to promote growth.





Diseases and Insects

Diseases of Ladino clover are seldom of importance, although the clover may be slightly injured by the organisms that attack common white clover.

The potato leafhopper, *Empoasca fabae* (Harr.), and the flea beetle, *Halticus citri* (Ashm.), are at present the most destructive insects of Ladino clover. The leafhopper kills the young leaves and causes a reddening and yellowing of the more mature leaves. When growing vigorously, Ladino clover is grazed or cut every 15 to 20 days, and this reduces the eggs and young nymphs.

Small, whitish spots scattered over most of the leaf surface are frequently found and are attributed to the small black garden flea beetle. At certain times the damage caused by this insect may be considerable.

How to Produce the Seed

Practically all the Ladino clover seed is produced in the Western States under irrigation. In the Eastern States the generally unfavorable climatic conditions make seed production hazardous as a farm enterprise. The period of greatest blooming is generally in the latter part of June and in early July. During cool, moist, cloudy weather the plants continue to make rapid vegetative growth and bloom sparingly, with the result that the seed yield is low. Grazing or clipping the early flush spring growth is conducive to free blooming and facilitates seed harvesting. If the clover is grazed, the cattle should be removed from 4 to 6 weeks before the time when the maximum number of flower heads is expected. Bright, warm, dry weather is conducive to abundant flowering. Such conditions occasionally occur in August.

Because cross-pollination is necessary for seed formation, it is advisable to move hives of honeybees adjacent to the fields before the plants bloom. A minimum of one hive per acre materially increases seed production.

Usually the seed is ready for harvest 3 to 4 weeks after the greatest number of flower heads have bloomed and may be cut with an ordinary mower and cured in the swath or in the windrow. After it is dry, the crop should be handled with care to avoid heavy losses from shattering. The seed may be hulled by a combine or by a thresher equipped with hulling attachments.